

**HITACHI**  
Inspire the Next

# HITACHI VARIABLE FREQUENCY DRIVES



**WJ200 series**  
Pursuing the Ideal  
Compact Inverter



**SJ700 series**  
High performance with Many useful  
Functions and, yet User Friendly







**X200 series**  
Simple, Trip-suppression and  
Eco-friendly Compact Inverter



**L700 series**  
Inverter designed to meet  
fans & pumps plus conveyors

# Hitachi Has Developed Intelligent and Sophisticated Variable Frequency Drives to Meet Various Requirements from a Wide Range of Demanding Applications!

## Specifications

Series		WJ200	X200		SJ700	L700	Series		
Appearance							Appearance		
Power Source	Rated input voltage	1-phase (100V)	100–120V +/-10%, 50/60Hz +/-5%	—	—	—	Power Source	Rated input voltage	1-phase (100V)
		1-phase (200V)	200–240V +10%/-15%, 50/60Hz +/-5%	200–240V +10%/-15%, 50/60Hz +/-5%	—	—			1-phase (200V)
		3-phase (200V)	200–240V +10%/-15%, 50/60Hz +/-5%	200–240V +10%/-15%, 50/60Hz +/-5%	200–240V +10%/-15%, 50/60Hz +/-5%	200–240V +10%/-15%, 50/60Hz +/-5%			3-phase (200V)
		3-phase (400V)	380–480V +10%/-15%, 50/60Hz +/-5%	380–480V +10%/-15%, 50/60Hz +/-5%	380–480V +10%/-15%, 50/60Hz +/-5%	380–480V +10%/-15%, 50/60Hz +/-5%			3-phase (400V)
Applicable motor		0.1–15kW	0.2–7.5kW		0.4–400kW	11–160kW	Applicable motor		
Output frequency range		0.1–400Hz	0.5–400Hz		0.1–400Hz*1	0.1–400Hz	Output frequency range		
Starting torque*5		200% or greater (at 0.5Hz) (Sensorless vector control)	100% or greater (Torque boost mode)		200%, or greater (at 0.3Hz) 75 to 132kW: 180%, or greater (at 0.3Hz), 185kW and over:150%, or greater (at 0.3Hz) 150%*2 at around 0Hz, 75kW and over:130%*2 at around 0Hz	150%(120)*3, or greater (at 0.5Hz) (Sensorless vector control)	Starting torque*5		
Braking torque	Dynamic brake (capacitor feedback)	10–50%	20–50%		10–20%	10–20%	Braking torque	Dynamic brake (capacitor feedback)	
	DC brake	Variable operating frequency, time, and braking force	Variable operating frequency, time, and braking force		Variable operating frequency, time, and braking force	Variable operating frequency, time, and braking force		DC brake	
Overload capacity		Dual rating: CT (Heavy duty) : 150%, 60sec. VT (Normal duty): 120%, 60 sec.	150%, 60sec.		150%, 60sec., 200%, 3sec. (185kW and over : 150%, 60sec., 180%, 0.5sec.)	120%, 60sec., 150%, 3sec.	Overload capacity		
Acceleration/deceleration time		0.01–3,600sec.	0.01–3,000sec.		0.01–3,600sec.	0.01–3,600sec.	Acceleration/deceleration time		
Multispeed operation		Max. 16-stage (Bit command also available)	Max. 16-stage		Max. 16-stage (Bit command also available)	Max. 16-stage (Bit command also available)	Multispeed operation		
Analog input for frequency control		0–10VDC, 4–20mA	0–10VDC, 4–20mA		0–10VDC, 4–20mA –10 to +10VDC	0–10VDC, 4–20mA –10 to +10VDC	Analog input for frequency control		
Protective functions		Over-current, over-voltage, under-voltage, overload, brake resistor overload, CPU error, memory error, external trip, USP error, ground fault detection at power on, temperature error, internal communication error, driver error, thermistor error, brake error, safe stop, overload at low speed, modbus communication error, option error, encoder disconnection, speed excessive, EzSQ command error, EzSQ nesting error, EzSQ execution error, EzSQ user trip	Over-current, over-voltage, under-voltage, overload, overheat, ground fault at power-on, input over-voltage, external trip, EEPROM error, CPU error, USP error, Thermistor error, Driver error, Emergency stop		Over-current protection, over-voltage protection, under-voltage protection, electronic thermal protection, temperature error protection, instantaneous power failure protection, phase loss input protection, braking-resistor overload protection, ground-fault current detection at power-on, USP error, external trip, emergency stop trip, CT error, communication error, option board error	Over-current protection, over-voltage protection, under-voltage protection, electronic thermal protection, temperature error protection, instantaneous power failure protection, phase loss input protection, braking-resistor overload protection, ground-fault current detection at power-on, USP error, external trip, emergency stop trip, CT error, communication error, option board error	Protective functions		
Other functions		Free V/f setting (7 breakpoints), PM motor control (corresponds more than Ver.2.0), Simple positioning control, Easy sequence programming function, Safe stop, Password, Peer-to-Peer communication, frequency upper/lower limit, jump (center) frequency, manual torque boost level/breakpoint, energy-saving operation, analog meter adjustment, Minimum time deceleration, Over-current Suppress, electronic thermal function (available also for free setting), external start/end frequency/frequency rate, restart after instantaneous power failure, Controlled deceleration on power loss, auto-tuning	AVR (Automatic Voltage Regulation), V/f characteristic selection, accel./decel. curve selection, frequency upper/lower limit, 16 stage multispeed, PID control, frequency jump, external frequency input bias start/end, jogging, cooling fan On/Off, trip history		Free V/f setting (7 breakpoints), frequency upper/lower limit, jump (center) frequency, acceleration/deceleration according to characteristic curve, manual torque boost level/breakpoint, energy-saving operation, analog meter adjustment, start frequency setting, carrier frequency adjustment, electronic thermal function (available also for free setting), external start/end frequency/frequency rate, analog input selection, retry after trip, restart after instantaneous power failure, output of various signals, starting with reduced voltage, overload restriction, initial-value setting, automatic deceleration at power failure, AVR function, fuzzy acceleration/deceleration, online/offline auto-tuning, high-torque multi-motor operation (sensorless vector control of two motors by one inverter)	Free V/f setting (7 breakpoints), frequency upper/lower limit, jump (center) frequency, acceleration/deceleration according to characteristic curve, manual torque boost level/breakpoint, energy-saving operation, analog meter adjustment, start frequency setting, carrier frequency adjustment, electronic thermal function (available also for free setting), external start/end frequency/frequency rate, analog input selection, retry after trip, restart after instantaneous power failure, output of various signals, starting with reduced voltage, overload restriction, initial-value setting, automatic deceleration at power failure, AVR function, online/offline auto-tuning	Other functions		
Environmental conditions	Ambient operating temperature	–10 to 50 degrees C*4	–10 to 50 degrees C*4		–10 to 50 degrees C*4	–10 to 40 degrees C*4	Environmental conditions	Ambient operating temperature	
	Humidity	20 to 90%RH (No condensation)	20 to 90%RH (No condensation)		20 to 90%RH (No condensation)	20 to 90%RH (No condensation)		Humidity	
	Location	Less than 1,000m of altitude, indoors (no corrosive gas nor dust)	Less than 1,000m of altitude, indoors (no corrosive gas nor dust)		Less than 1,000m of altitude, indoors (no corrosive gas nor dust)	Less than 1,000m of altitude, indoors (no corrosive gas nor dust)		Location	

\*1 : 400kW is 0.1–120Hz \*2 : When inverter is one frame size larger than motor. \*3 : 90kW and over  
\*4 : See derating data and carrier frequency adjustment in instruction manual when ambient operating temperature is 40 degrees C or over.

\*5 : The characteristic is different according to the motor combination.

## Product Range

Model	kW (HP)	0.1 (1/8)	0.2 (1/4)	0.4 (1/2)	0.55 (3/4)	0.75 (1)	1.1 (1.5)	1.5 (2)	2.2 (3)	3 (4)	3.7 (5)	4 (5)	5.5 (7.5)	7.5 (10)	11 (15)	15 (20)	18.5 (25)	22 (30)	30 (40)	37 (50)	45 (60)	55 (75)	75 (100)	90 (125)	110 (150)	132 (175)	150 (200)	160 (220)	185 (250)	220 (300)	315 (400)	400 (500)		
WJ200	1-phase 100V class																																	
	1-phase 200V class																																	
	3-phase 200V class																																	
	3-phase 400V class																																	
X200*1	1-/3-phase 200V class			Note 3		Note 3																												
	3-phase 200V class																																	
	3-phase 400V class									Note 3		Note 4																						
SJ700	3-phase 200V class																																	
	3-phase 400V class											Note 5	Note 4																					
L700	3-phase 200V class																																	
	3-phase 400V class																																	

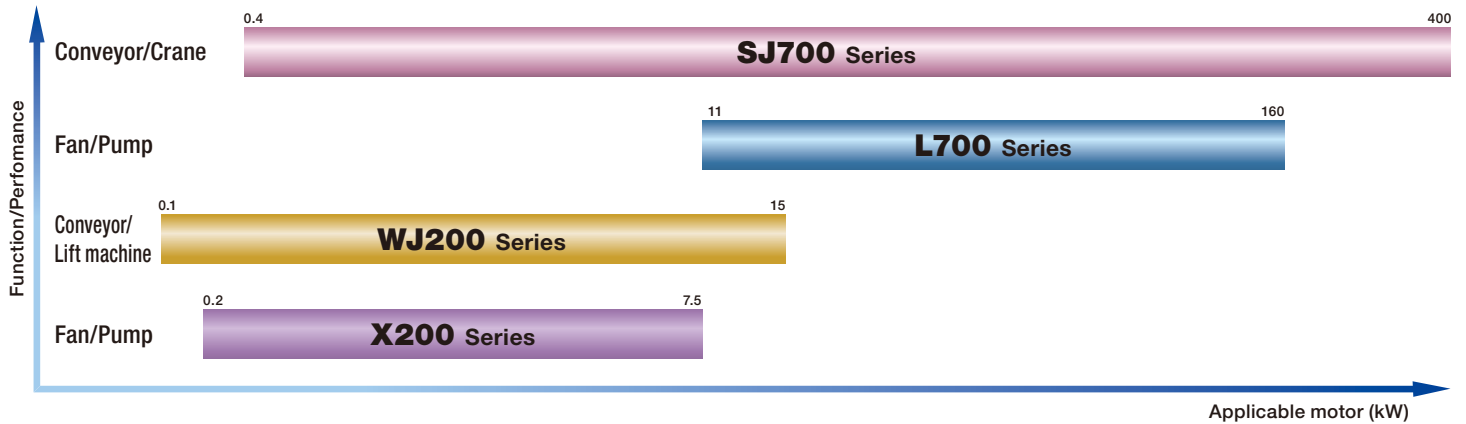
Note 1 : European version have EMC filter as standard. (EN61800-3 cat. C1 for SFEF series, cat. C2 for HFEF series)

Note 2 : European version and JP version does not have 150kW model.US version does not have 132kW model.

Note 3 : Available only for European version

Note 4 : Available only for European version and US version

Note 5 : Available only for JP version



## Model Name Indication

# X200 - 004 S F E F 2

Series Name

2 : Version

F : Integrated noise filter

U : US version

E : European version

F : With digital operator

S : 1-phase 200V class

N : 1-/3-phase 200V class

L : 3-phase 200V class

H : 3-phase 400V class

M : 1-phase 100V class

Applicable Motor Capacity in kW (HP)

001 - 0.1 (1/8)	220 - 22 (30)
002 - 0.2 (1/4)	300 - 30 (40)
004 - 0.4 (1/2)	370 - 37 (50)
005 - 0.55 (3/4)	450 - 45 (60)
007 - 0.75 (1)	550 - 55 (75)
011 - 1.1 (1.5)	750 - 75 (100)
015 - 1.5 (2)	900 - 90 (125)
022 - 2.2 (3)	1100 - 110 (150)
030 - 3 (4)	1320 - 132 (175)
037 - 3.7 (5)	1500 - 150 (200)
040 - 4 (5)	1600 - 160 (220)
055 - 5.5 (7.5)	1850 - 185 (250)
075 - 7.5 (10)	2200 - 220 (300)
110 - 11 (15)	3150 - 315 (400)
150 - 15 (20)	4000 - 400 (500)
185 - 18.5 (25)	

# WJ200 Series

## Pursuing the Ideal Compact Inverter



### Feature

#### Industry-leading Levels of Performance

- High starting torque of 200% or greater achieved by sensorless vector control (when sized for heavy duty).
- Speed regulation at low-speed is improved.
- Trip avoidance functions (Minimum time deceleration function and over-current suppress function).
- Simple positioning control (when feedback signal is used).
- Induction motor & Permanent magnetic motor\* control with one inverter (\*corresponds from Ver. 2.0).

#### Pursuit of Ease of Use

- Easy sequence [EzSQ] programming function.
- Safe stop function. (Cat. 3, PLd to EN / ISO 13849-1 and SIL CL2 to EN 62061 / IEC 61508 /EN 61800-5-2)
- Password function.
- USB (Mini-B connector) port and RS-422 (RJ45 connector) port are standard.
- Ease of wiring.
- Easy to maintain.
- Side-by-side installation.
- Allows manual adjustment of the inverter output frequency by turning the optional potentiometer module.

Potentiometer Option



#### Ease of Maintenance

- Long life time components (Design life time 10 years or more).
- Cooling fan ON/OFF control for longer fan life.
- Life time warning function.
- Easy-removable cooling fan.

#### Environmental Friendliness

- Micro surge voltage suppress function.
- EU RoHS compliant (ordered items).
- Varnish coating of internal PC board is standard. (Logic PCB and I / F PCB are excluded.)

#### Global standards

- Conformity to global standards. CE, UL, c-UL, C-Tick approvals.



- A serial RS-485 Modbus<sup>®</sup> RTU port is standard. DeviceNet<sup>™</sup>, CompoNet<sup>™</sup>, PROFIBUS<sup>®</sup> and CANopen with optional expansion card (planned).
- Wide input power voltage range. (Input voltage 200V to 240V for 200V class and 380V to 480V for 400V class as standard)
- Logic input and output terminal can be configured for sink or source logic.

WJ200 Series		0.1	0.2	0.4	0.75	1.5	2.2	3.0	3.7	4.0	5.5	7.5	11	15
Applicable motor rating in kW (HP)		(1/8)	(1/4)	(1/2)	(1)	(2)	(3)	(4)	(5)	(5)	(7.5)	(10)	(15)	(20)
1-phase 100V	MF			●	●									
1-phase 200V	SF	●	●	●	●	●	●							
3-phase 200V	LF	●	●	●	●	●	●	●	●	●	●	●	●	●
3-phase 400V	HF			●	●	●	●	●	●	●	●	●	●	●

● : Available

• Modbus is a registered trademark of Modicon Inc. (Schneider Automation International).  
 • DeviceNet is a trademark of Open DeviceNet Vendor Association.

• CompoNet is a trademark of Open DeviceNet Vendor Association.  
 • PROFIBUS is a registered trademark of Profibus Nutzer Organization.

# X200 Series

## Simple, Trip-suppression and Eco-friendly Compact Inverter



### Feature

#### Environmental Friendliness

- Integrated EMC filter saves cost and space (European version only).  
Single-phase input : EN61800-3 cat.C1  
Three-phase input : EN61800-3 cat.C2
- RoHS compliance for all models.
- Micro Surge Voltage suppress function.
- Varnish coating of internal PC boards is standard, for longer life in harsh environments.

#### Useful fan and pump functions

- Improved Trip Avoidance Function (Over-current, over-voltage).
- Automatic energy-saving function delivers "realtime" energy-saving operation for fan and pump applications.
- Improved PID control.
- Allows for smooth restart when an IPF (Instantaneous Power Failure) occurs. This is especially useful in fan and pump applications.

#### Ease of Maintenance and space reduction

- Easily replaceable cooling fan.
- Cooling fan ON/OFF control extends fan life.
- Side-by-side installation.
- Safe Stop Function. (EN954-1 : 1997, category 3, EN60204-1 : 1997 Category 0)

#### Global Performance

- CE, UL, c-UL and c-Tick approvals.



- Logic input terminal apply sink and source logic.
- Wide Input power voltage range  
(Input voltage 200V to 240V for 200V class and 380V to 480V for 400V class as standard).
- RS-485 is provided as standard for Modbus<sup>®</sup> RTU serial communication.

<b>X200 Series</b> Applicable motor rating in kW (HP)		0.2 (1/4)	0.4 (1/2)	0.55 (3/4)	0.75 (1)	1.1 (1.5)	1.5 (2)	2.2 (3)	3.0 (4)	3.7 (5)	4.0 (5)	5.5 (7.5)	7.5 (10)
1-phase 200V	SFEF2	●	●	●	●	●	●	●					
	NFU2	●	●	●	●	●	●	●					
3-phase 200V	LFU2									●	●	●	●
	LFRF2	●	●	●	●	●	●	●	●	●	●	●	●
3-phase 400V	HFEF2		●	●	●	●	●	●	●		●	●	●
	HFU2		●	●	●	●	●	●	●		●	●	●
	HFRF2		●	●	●	●	●	●	●		●	●	●

●: Available

● LONWORKS is a registered trademark of Echelon Corporation.  
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# SJ700 Series

**High performance with  
Many useful Functions and,  
yet User Friendly**



## Feature

### High starting Torque, Powerful Drive and easy set up

- High Starting Torque 200% at 0.3Hz.  
(75 to 132kW : 180% at 0.3Hz, 185kW and over : 150%, at 0.3Hz)
- Hitachi exclusive 0Hz Domain sensorless vector control.
- High accuracy & improved Auto-tuning function.
- Full Vector Control with Feedback option  
(Torque Control, Position Control).

### Many useful Functions

- Over current & voltage suppress function.
- Sequence operation is realized by downloading to an inverter a program created with Hitachi's Pro Drive Next software.
- EMI Filter will be built-in (Category C3 up to 150kW\*).  
(\*European Version and JP Version does not have 150kW.)
- Internal Braking Circuit will be built-in up to 22kW.
- Emergency Stop Function.
- DC Bus AVR Function During Deceleration.
- Using optional WOP operator, SJ300 parameters can be transferred easily to SJ700.

### Long lifetime components & Ease of Maintenance

- Long life components for improved maintainability.
- Easily replaceable cooling fans and bus capacitors speed field maintenance.
- Common wiring terminals with previous model series simplifies replacement wiring.

### Easy Operation

- Data comparison function shows only parameters changed from factory default.
- Ability to define 12 user-selectable parameters for display.
- Basic mode shows only most commonly used parameters.

### Environmental Friendliness

- Micro Surge Voltage suppress function.
- EU RoHS compliant by restricting to use hazardous substances (except solder in power module).
- Varnish coating of internal PC board & plating of main circuit copper bus bar as standard.

### Global standards

- Conformity to global standards. CE, UL, c-UL, C-Tick approvals.



- RS-485 communication port with Modbus<sup>®</sup> RTU protocol is available as standard for all models.
- Compatibility with networks such as DeviceNet<sup>™</sup> and PROFIBUS<sup>®</sup>, with communication options.
- Logic input & output terminals are selectable for sink & source logic.
- Wide Input power voltage range.

## SJ700 Series

Applicable motor rating in kW (HP)

		0.4 (1/2)	0.75 (1)	1.5 (2)	2.2 (3)	3.7 (5)	4.0 (5)	5.5 (7.5)	7.5 (10)	11 (15)	15 (20)	18.5 (25)	22 (30)	30 (40)	37 (50)	45 (60)	55 (75)	75 (100)	90 (125)	110 (150)	132 (175)	150 (200)	185 (250)	220 (300)	315 (400)	400 (500)		
3-phase 200V	LFUF2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○	
	LFF2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○
3-phase 400V*1	HFEF2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	HFUF2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	HFF2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

●: Available ○: Plan model

• Modbus is a registered trademark of Modicon Inc. (Schneider Automation International).  
• DeviceNet is a trademark of Open DeviceNet Vendor Association.

• PROFIBUS is a registered trademark of Profibus Nutzer Organization.

\*1 : Model name (185kW to 400kW) : HF2, HFE2, HFU2

# L700 Series

**Inverter designed to meet fans & pumps plus conveyors**



## Feature

### High starting torque 150% (90kW and over: 120%) at 0.5Hz

- Sensorless Vector Control so the L700 can be applied to constant torque loads where high starting torque is needed.
- On-line/off-line auto-tuning.

### Long lifetime components & Ease of Maintenance

- Design lifetime 10 Years or more for DC bus capacitors & Cooling Fan.
- Life time warning function.
- Field replacement of cooling fan(s) and DC bus capacitors (18.5kW and over) can be accomplished in a fraction of the time.
- Move existing L300P logic terminal strip to L700 without wiring change.
  - \*L700 series standard control terminals are the same as SJ700/SJ300. Output terminals are all open collector type.
- Read L300P parameters via WOP remote operator and write them to L700.

### Various versatile functions and compact design to save space

- Sequence operation is realized by downloading to an inverter a program created with Hitachi's Pro Drive Next software.
- External components can be simplified or eliminated, resulting in cost-savings.
- EMC Filter is built in for all models.
- Dynamic brake circuit is included up to 30kW.
- Over-current suppress functions reduce nuisance tripping.

### Global standards

- Conformity to global standards. CE, UL, c-UL, C-Tick approvals.



- Logic input & output terminals are selectable for sink & source logic.
- Input voltage 200V to 240V for 200V class and 380V to 480V for 400V class as standard.
- A serial RS-485 Modbus® RTU port is standard.
- The L700 can communicate via DeviceNet™ and PROFIBUS® with optional expansion cards.

<b>L700 Series</b> Applicable motor rating in kW (HP)		11 (15)	15 (20)	18.5 (25)	22 (30)	30 (40)	37 (50)	45 (60)	55 (75)	75 (100)	90 (125)	110 (150)	132 (175)	160 (220)
<b>3-phase 200V</b>	<b>LFF</b>	●	●	●	●	●	●	●	●	●				
<b>3-phase 400V</b>	<b>HFF</b>	●	●	●	●	●	●	●	●	●	●	●	●	●

●: Available

•DeviceNet is a trademark of Open DeviceNet Vendor Association.  
•PROFIBUS is a registered trademark of Profibus Nutzer Organization.

•Modbus is a registered trademark of Modicon Inc. (Schneider Automation International).

## Dimensions [Unit: mm(inch)] (Inches for reference only)

WJ200-	MF	—	—	004	—	007	—	—	—	—	—
	SF	001, 002	004	—	—	—	007-022	—	—	—	—
	LF	001, 002	004	—	007	—	015, 022	037	055, 075	110	150
	HF	—	—	—	—	004	007-030	040	055, 075	110, 150	—
Width	68(2.68)	68(2.68)	68(2.68)	68(2.68)	108(4.25)	108(4.25)	140(5.51)	140(5.51)	180(7.09)	220(8.66)	
Height	128(5.04)	128(5.04)	128(5.04)	128(5.04)	128(5.04)	128(5.04)	128(5.04)	260(10.24)	296(11.65)	350(13.78)	
Depth	109(4.29)	122.5(4.82)	132.5(5.22)	145.5(5.73)	143.5(5.65)	170.5(6.71)	170.5(6.71)	155(6.10)	175(6.89)	175(6.89)	

X200-	SFEF2	002	004	005, 007	011-022	—
	HFEF2	—	—	004	007-040	055, 075
	NFU2	002	004	007	015, 022	—
	LFU2	—	—	—	037	055, 075
	HFU2	—	—	004	007-040	055, 075
Width	80(3.15)	80(3.15)	110(4.33)	110(4.33)	180(7.09)	
Height	155(6.10)	155(6.10)	189(7.44)	189(7.44)	250(9.84)	
Depth	93(3.66)(*)	107(4.21)(*)	128(5.04)(*)	155(6.10)(*)	165(6.50)(*)	

SJ700-	HFEF2	007-040	055-110	150-220	300	370-550	—	750, 900	1100, 1320	1850, 2200	3150	4000
	LFUF2	004-037	055-110	150-220	300	370-450	550	—	—	—	—	—
	HFUF2	007-040	055-110	150-220	300	370-550	—	750, 900	1100, 1500	1850, 2200	3150	4000
Width	150(5.91)	210(8.27)	250(9.84)	310(12.20)	390(15.35)	480(18.90)	390(15.35)	480(18.90)	695(27.36)	680(26.77)	1050(41.34)	
Height	255(10.04)	260(10.24)	390(15.35)	540(21.26)	550(21.65)	700(27.56)	700(27.56)	740(29.13)	995(39.17)	1300(51.18)	1700(66.93)	
Depth	140(5.51)	170(6.69)	190(7.48)	195(7.68)	250(9.84)	250(9.84)	270(10.63)	270(10.63)	370(14.57)	450(17.72)	450(17.72)	

L700-	HFF	110-150	185-300	370	450-750	—	900, 1100	1320, 1600
	LFF	110-150	185-300	370	450, 550	750	—	—
Width	210(8.27)	250(9.84)	310(12.20)	390(15.35)	480(18.90)	390(15.35)	480(18.90)	
Height	260(10.24)	390(15.35)	540(21.26)	550(21.65)	700(27.56)	700(27.56)	740(29.13)	
Depth	170(6.69)	190(7.48)	195(7.68)	250(9.84)	250(9.84)	270(10.63)	270(10.63)	

\*1: Add 4.4mm (0.17inch) for potentiometer.








Information in this brochure is subject to change without notice.

*For further information, please contact your nearest sales representative.*

 **Hitachi Industrial Equipment Systems Co., Ltd.**

<p><b>ISO 14001</b></p>   	<p>Hitachi variable frequency drives (inverters) in this brochure are produced at the factory registered under the ISO 14001 standard for environmental management system and the ISO 9001 standard for inverter quality management system.</p>
<p><b>ISO 9001</b> JQA-1153</p>	